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ABSTRACT

This paper begins with a discussion of outsourcing. The first section summarizes an Australian Computer Society paper on information technology outsourcing, including reasons for outsourcing and critical issues. The second section discusses the outsourced library, including: the use of the Internet to deliver services; replacement of the library with a remotely delivered service; provision of online services by specialist information services run from computer systems located anywhere in the world; the need for standards-based systems; the use of XML (Extensible Markup Language) as a format for metadata; the ongoing need to cope with multiple standards; and the role of libraries in ensuring future access to digital materials. The third section addresses the use of the Linux operating system to provide database and World Wide Web transaction processing systems for library applications. The fourth section considers what is left for the library to do, including the library's role in creating a more diverse publishing system by supporting open standards and in helping to mitigate the problems of consolidation of global corporate publishing. The fifth section covers the role for the library, including providing access to the Internet for the community and access to information for the disabled. (MES)

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Proceedings

The Network Becomes the Library: The need for Supportability

Tom Worthington

Outsourcing

> *"An arrangement whereby a third party provider assumes responsibility for performing information systems functions at a pre-determined price and according to predetermined performance criteria."* (*Northfield 1992*).

Outsourcing can improve the delivery of services, but risk loss of control of quality and costs. The Australian Computer Society commissioned a study of IT outsourcing in 1997 (*ACS 1997*), which was presented in evidence to the Senate Finance and Public Administration References Committee IT Outsourcing inquiry (*Hansard 1997*) by Ian Dennis and myself.

Preparing the study was itself an exercise in the use of IT and contracting out. We were able to prepare a detailed "paper" on a complex paper in a relatively short time, using people at different locations communicating on-line. Members of the press commented on the benefits of having the detailed final document immediately available online, with hypertext links to background material.

In its Senate submission the ACS recommended caution on whole-of-Government IT Outsourcing, warning that it was a high risk approach, for individuals, organisations and for the community as a whole. The paper concluded that outsourcing assessment processes are a valid tool for Government and private organisations in matching operations to strategic needs. It could deliver cost savings and other benefits but if used inappropriately, significantly diminish service levels, incur major reconstruction costs, and cause social damage. Also it may not be necessary:

> *Many of these advantages can accrue just from the process of examining the outsourcing option, as a consequence of self-examination and formalisation. That is to say that they can accrue without outsourcing per se.(ACS 1997)*

The ACS's paper was addressed to Government, but in any organisation there is a need for processes to be open, accountable and participatory. Decisions made behind closed doors and communicated as a fait accompli are not in the public interest. It is important that all those involved understand their obligations and the risks, as well as the potential benefits.

Reasons for Outsourcing identified in the ACS paper were:

- Cost Savings
- Focus On Core Business
- Access To Skills
- Access To Technology
- Flexibility
- Accountability

Critical Issues with Outsourcing were:

- Transaction Costs

- Hidden / Additional Costs
- Lack of Flexibility
- Loss of Control
- Human Resource Problems
- Lock-In, Vulnerability and Dependence:
- Privacy and Confidentiality
- Intellectual Property and Competition
- Opportunity Cost

The Outsourced Library

Given that outsourcing is a valid tool, how can it be used with IT in a library? One way is that the Internet can be used to deliver services. This doesn't require any new or revolutionary technology: the technology is already here and the revolution is already happening. However, it requires new skills for the people involved both in the outsourcing client organisation and the outsourcing company.

In the most extreme case the Library could be replaced with an outsourced, remotely delivered service. The library would consist of a bundle of web based services: the catalogue, research and information services. E-books, journals and newspapers would be provided online wia contracts with content owners. Services which could not be delivered via a web interface would be available by e-mail (such as more complex research queries) and by telephone. There may optionally be a service for delivery of paper books and magazines, with delivery to the clients site or at a service location (what was previously called a "library").

It should be noted that the bundle of services which is a library need not be provided by one organisation in one physical location, nor need there be an actual collection of books, as in a conventional library (books can be sourced from separate specialised sources or printed on demand). In a way a current library is a type of outsourcing organisation: contracting with various suppliers of goods and services to supply an integrated service to their borrowers.

The library as a bundle of on-line and print on demand services may seem an extreme view of a fictional future, however it exists in embryonic form today. You can look up Michael J Bourk's book (which I edited): Universal Service? - Telecommunications Policy In Australia and People with Disabilities on the web in the National Library of Australia catalogue. The note field gives the address where a web version of the book can be read on-line for free. An electronic version of the book can be purchased and downloaded. Even if a library orders a copy of the book through the usual library supply channels, it is demand printed on a laser printing press. Printed stocks of the book do not exist in any warehouse. It may therefore make sense to rationalise the supply chain and combine the library supplier and the libraries.

The different online services of a library could be provided by specialist information services run from computer systems located anywhere in the world. E-mail and telephone enquiries could be routed to an appropriately skilled person who would service the library requirements of any number of organisations, in a similar way to telephone call centres. In a study I am carrying out for an Australian local government body, I point out that web based call centres are feasible and need not be limited to low paid semiskilled tasks (*GSDC 2000*). A review of previous literature was carried out for the study by the The Library of the Australian National University , with the request by e-mail, the deliverable as a web page and payment by direct entry. There were a couple of telephone calls and no visits to the physical library.

In general Libraries are not in the business of handling things, but providing access to information.

This places them at the forefront of the Internet revolution. In the first phase of this revolution we saw the Internet used as a direct replacement for existing technology: e-mail in place of paper mail, web publications in place of paper publications. This technology-by-analogy approach is coming to an end. We will now see the Internet used in ways which have no off-line equivalent and providing insights on how to build and run organisations.

Outsourced staffless, building-less libraries are feasible. However, it should be noted that this only indicates that outsourcing is made possible; *if* it should be carried out is a wider public policy question. Also it is possible to outsource some or all of the services of the physical library, particularly where these are provided remotely (from book-stacks, by post, telephone or fax). Equally, online libraries could still have a physical presence, with a shop front somewhat like modern bank branch, with rows of ATMs and perhaps one part time staff member to provide customer assistance. While those lucky enough to have access to Australia's excellent full service libraries may not like an ATM library it might allow a service to be provided more widely.

The use of networked services creates a need for open standards based systems, to replace current closed systems. If outsourced services from on-line suppliers are to be used by a library (or to *create* a library), then standards are needed. The two ways to acquire an IT system used to be to either to build it or buy it. Either option was a major undertaking, with years of effort needed and the system expected to be in use for many more years. The Internet and the web have shown another option: build the system from standard components. The components, and the suppliers of the components, can be changed relatively simply, quickly and frequently. The standards used can;t be changed as often and provide the long term stability for the service.

As an example of this process I have been consulting to a Federal Government agency on the move of their web site to a new host. Most of the complexity of the move is involved with the enhancements to a few dozen pages of static content, not the actual move. The site has most content drawn from several agencies and uses XML based meta-data and search engines. Exactly which agencies and what the data is has also changed. However, this is of little concern provided the Internet standards are used.

The Extensible Markup Language (XML) from the World Wide Web Consortium, attempts to overcome limitations with HTML (used for the Web). Apart from being used to provide extended web pages, it can also be used for providing a format for meta-data.

Librarians are used to dealing with meta-data in well defined standard formats and well aware of the problems of adding a new "standard" formats, so why bother with XML? It is not certain, but it looks as if XML will be used for many applications, making it cheaper and easier.

One example of one use of XML is for XHTML, which provides a more carefully formatted implementation of HTML using the XML syntax. XHTML is designed to allow a bridge between the existing web and new features. XHTML's stricter definition will require some minor adjustments for web authors, such as TAGS being in lower case (<i> for italics, not <I>). In return for these minor inconveniences, XHTML allows extensions to be easily added for special applications.

Another use for XML is to provide actual "books". There are several proposed XML based formats for electronic books, including the Open eBook Forum's Open eBook Publication Structure. This attempts to be expressive enough for paper publishing, while maintaining compatibility with web browsers. It should also be useable with hand-held e-book devices.

It should be noted that there will be an ongoing need to cope with multiple standards. As an example the Australian Digital Theses Program aims to establish a distributed database of digital versions of theses produced by the postgraduate research students at Australian Universities. Dublin Core metadata is automatically generated out of the deposit form for each thesis deposited. The metadata is presented with HTML 4.0 Meta-tags, but with the tools used could as well be

presented in It is intended to use an e-commerce model to charging for printing/downloading of documents.

The Australian Digital Theses Program currently uses PDF format for document storage, which has severe limitations as an electronic document format. The Open eBook Publication Structure. Or a similar XML based e-book format would be more efficient and suitable for on-screen reading that PDF. However, a widely accepted XML based format is not yet available.

Librarians have a central role to play in ensuring future access to digital materials. Publishers may increasingly see the content as perishable: prepared for a mass market in whatever is the current trendy digital format. XML has the potential to provide lasting format, but requires research and standards work.

Librarians are in the business of organising online resources. A collection of material, even material available free from the web can in itself become a valuable new work. PictureAustralia, which provides integrated access to the image collections of a number of Australia's cultural institutions provides a preview to the future. The National Library of Australia hosts PictureAustralia, but the pictures can be located at any of the cultural institutions. The creation of standard metadata for each picture and the theme of collections of photographs creates a valuable new resource, distinct from the individual photographs.

Linux

The rise of Linux as a global phenomenon is is worthy of research by sociologists and marketeers. This is not to detract from Linux's potential as an operating system, but to point out that the way Linux was developed and promoted may provide a new model for doing business. Linux is essentially a free clone of the propriety Unix operating system, built by an on-line consortium of volunteers to run on desktop PCs in place of Microsoft Windows. Some of the Linux volunteers are individuals, some are very large corporations. The product of this labour is given away, but has become a large business, through sales of technical support, manuals and add-on software.

Linux is usable in large organisations, where staff to install and support it are available. It isn't quite ready for the small business or home user, due to being more difficult to install and configure than Microsoft Windows of the Apple Macintosh operating system and having a very much more limited range of end-user software packages available.

Linux has a symbiotic relationship with the Internet, the web and standards. It is very popular as the host for web sites and due to its lack of one large commercial backer, relied on standards and on the Internet for tying its elements together.

On 19 July, Sun Microsystems, Inc. announced it will release the source code of its StarOffice (TM) Suite, to the open source community under a GNU General Public License (GPL). Part of this is to define a set of XML-based file formats for word processing, spreadsheets and presentation tools. Combined with the capabilities of XML enabled web browsers, such as the open-source Mozilla, this provides the possibility of low cost software generating portable file formats. A document created in a presentation tool could then be presented using a web browser. There would be no need to convert the file from one proprietary format to another, or download a special viewer program, the web browser would display the document directly. It also creates the possibility of more flexible document formats, such as integrating a printable text document and a slide show in the one file, or displaying database records as a document. An ambitious example of attempting such a system is the Mozilla.org's proposal for an open source combined word processor and Web editor, based on the Mozilla web browser. This software will most likely be released for Linux before any other operating system.

Rather than going to a major vendor of mainframes for a large computer system, it is possible to read a cookbook and build your own with components from the local PC shop. The ANU has built a Linux supercomputer from PCs stacked on old library shelves. The same technology could be used to provide very large database and web transaction processing systems for library applications.

What is left for the library to do?

If e-publishers can deliver e-books and e-zines via e-commerce, what is left for the library to do? While a commercial e-future is feasible for libraries, it is not necessarily a desirable future. Public and academic libraries have a central role in creating a more diverse publishing system, by supporting open standards and in helping mitigating the problems of consolidation of global corporate publishing.

Left to their own commercial forces, companies will produce incompatible, proprietary publishing technology. Market forces might eventually create a de-facto standard, but the rate of technical development may outpace this and the de-facto standard may result from one company dominating global information distribution.

The development of Linux shows a way in which organisations and individuals can co-operate to create technology which has a public benefit, but which can also involve private profit.

As the network becomes the Library, there is a very real risk of the loss of valuable information to the community. Libraries have the central role in pioneering ways to ensure information is supplied in a sustainable and supportable way.

Access to the Disabled: A Role for The Library

One role libraries have fulfilled is to provide access to information for those who could otherwise not have it. One recent example where Libraries have fulfilled this role is in providing access to the Internet and the web for the community.

In 1994 Roger Clarke and I argued (*ACS 1994*) that public libraries held the key to equity of access to the Internet. Governments responded by making some additional finding available to provide Internet access available to Libraries.

Another valuable role which libraries have previously played has been in access to information by the disabled. Libraries have traditionally provided special equipment for the reading of print material by those with visual impairments and by special formats such as large print, talking books and books in languages other than English.

The Internet began with a head start for the disabled: by having text as its basic medium text, it allowed material to be easily transformed into formats such as large text, speech and Braille. When graphical features were added to the web, consideration was given to maintaining accessibility, by including alternative text (essentially captions) for images.

This head start with accessibility has recently been eroded with poorly trained web developers not using the webs accessibility features and tool developers failing to build accessibility features into new web formats.

Graphic designers who have moved into web development may be excused for not knowing about accessibility. However, IT professionals, who's discipline has for many years included the human factors of interface design, have no excuses. As the case brought against SOCOG shows, organisations may be engaged in unlawful conduct by providing a web site which was to a significant extent inaccessible to the blind. When designing for the public, IT professionals have an obligation to use the accessibility features built into the web. IT professionals who fail to use low cost accessibility features are acting unethically. Librarians have a role in reminding the rest of us how to go about providing accessibility, on a large scale and for the long term.

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